

Connect Thousands of Branch Offices—Quickly, Easily and Cost Effectively: SASE Architecture Converges WAN and Network Security Functions; Controls Access and Manages Traffic at the Edge for Ultimate Speed and Efficiency

Executive Overview

Digital transformation is fundamentally reshaping enterprise traffic flows introducing performance, security and service quality challenges for branch office network planners. Across the world, enterprises are adopting cloud-based applications and services to reduce infrastructure cost and complexity, accelerate business agility and unleash digital innovation. According to a 2019 industry survey, enterprises now run 79 percent of workloads in the cloud—46 percent in private clouds and 33 percent in public clouds.

Legacy branch office networks, designed to support traditional enterprise applications and services aren't well suited for the new cloud-first world of IT. The modern enterprise requires a modern enterprise network—an adaptable, application-aware network, designed from the ground up to handle today's diverse workloads and dynamic dataflows.

The 128T Session Smart Networking solution is a state-of-the art, service-centric networking solution that eliminates the inherent inefficiencies and cost constraints of traditional branch office networking and legacy SD-WAN solutions. The 128 Technology solution extends the benefits of SD-WAN to the branch office LAN, combining centralized management, programmability and control, with plug-and-play installation to enable a new software-defined branch (SD-Branch). The solution provides fast, secure and reliable branch office connectivity for today's digital businesses, with breakthrough economics and simplicity.

The 128T Session Smart Networking solution eliminates middlebox and VNF sprawl, converging networking and network security functionality into a single VNF, enabling what Gartner dubs the new Secure Access Service Edge (SASE). The SASE polices and manages traffic at the edge of the network, close to the end-user, for ultimate speed and efficiency.

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RightScale 2019 State of the Cloud Report

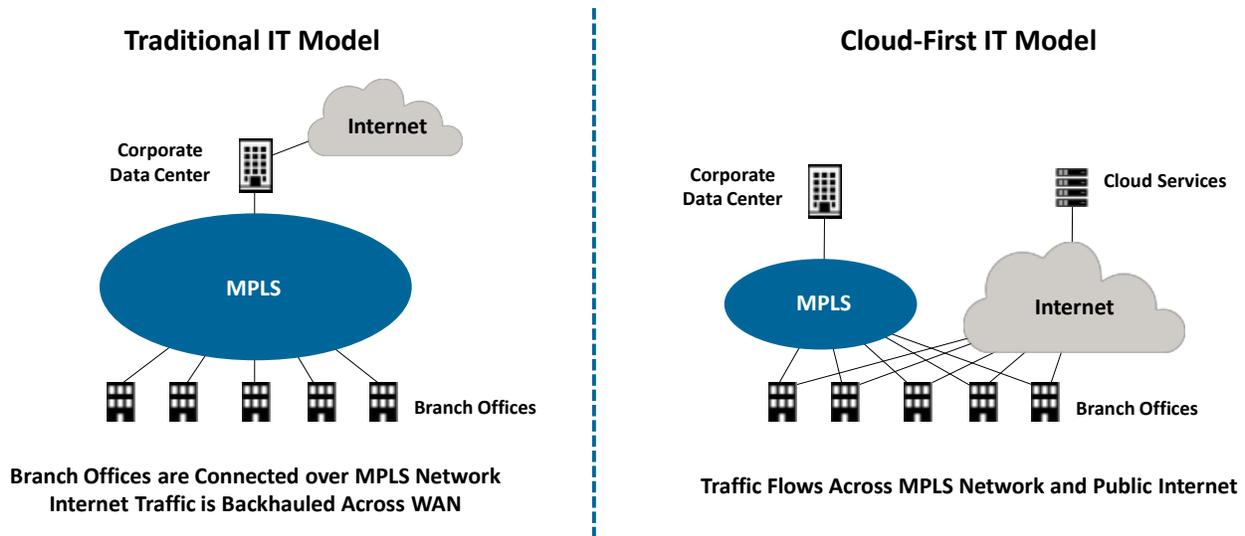
¹[RightScale 2019 State of the Cloud Report](#)

²The Future of Network Security is in the Cloud. ID G00441737. Gartner, Inc. August 30, 2019

Challenges

Digital transformation is fundamentally changing the way businesses deliver applications and services, and fundamentally reshaping enterprise traffic flows. Historically, most enterprises hosted applications in central corporate data centers. They connected branch offices over MPLS networks or private WANs, over which they had deep visibility and tight control. Most business-critical application traffic was confined to the enterprise network. External traffic (web, email, VoIP, etc.) was typically backhauled across the enterprise network and securely handed off to the internet.

In the new cloud-first model of IT, applications and services are hosted in public and private clouds (as well as in corporate data centers) and most branch office traffic is no longer confined to the enterprise. Instead, high volumes of business-critical application traffic often flows over best-effort public internet connections over which the enterprise has minimal visibility and control.



Legacy hub-and-spoke branch office networks, designed to support traditional business applications and traffic patterns, can't accommodate the dynamic workloads and diverse dataflows that dominate the modern enterprise. The new cloud-first model of IT introduces a variety of performance, security and availability requirements for enterprise network architects.

Performance

Today's businesses leverage a variety of cloud-based applications and services with distinct characteristics and QoS requirements. Some applications like unified communications and collaboration solutions and web meeting services are bandwidth-intensive and delay-sensitive. Other applications like CRM and SCM solutions are more tolerant of packet loss and latency. Network architects must find ways to prioritize, shape and efficiently route traffic to provide the right SLA for the right application.

Security

Cybercriminals and malicious insiders can exploit public and private data networks to steal confidential information or disrupt critical IT systems and services. Network planners must introduce strong security systems and practices to protect data privacy, and to defend enterprise and cloud infrastructure against denial of service attacks and other threats, without degrading performance, impairing user experiences or complicating operations.

Availability

Branch office connectivity failures can disrupt critical business applications, hinder worker productivity and impact the bottom line. Planners must ensure continuous access to mission-critical applications and services in the event of link failures or ISP outages.

Legacy Branch Office Networking Solutions Are Inherently Costly and Complex

Conventional branch office networking products and legacy SD-WAN solutions are inherently expensive and complicated, and can't meet the increased price-performance and agility demands of the digital era.

Middlebox Sprawl is Untenable

Many enterprises rely on a collection of special-purpose branch office networking and security solutions (routers, firewalls, IPS/IDS devices, VPN appliances, etc.) to enable secure and reliable connectivity. Middleboxes create a variety of headaches including:

- **Long, drawn-out rollouts.** Each middlebox is independently installed, configured and provisioned—a time-consuming, resource-intensive proposition that requires on-site expertise.
- **Inefficient swivel-chair management.** Each device has a unique administrative interface and APIs. Introducing new applications, expanding capacity or troubleshooting problems can be a manually intensive, error-prone endeavor involving multiple distinct CLIs or element management systems.
- **Complicated logistics.** IT teams are often forced to interact with multiple vendors for product procurement, support and software upgrades. Each vendor has a unique service program and software maintenance schedule. And product interoperability issues and compatibility problems can lead to vendor squabbles and finger-pointing.

Legacy SD-WAN Solutions are Too Expensive

Conventional SD-WAN solutions can help reduce cost and complexity by virtualizing network functions onto common commercial off-the-shelf hardware, but legacy SD-WAN products are still inherently expensive and inefficient. Legacy SD-WAN solutions use service chaining to route traffic through multiple virtual network functions (firewall, IPS/IDS, WAN optimizer, etc.). But each virtual network element is instantiated as a unique VNF that consumes CPU and memory. As a result, legacy SD-WAN solutions require high-density, multi-core systems that are too pricey for most branch office scenarios.

128T Session Smart Networking Enables an Identity-Centric Secure Access Service Edge Architecture

The 128T Session Smart Networking solution is an advanced, service-centric networking solution that takes software-defined routing to a new level. Fully software-based, the solution slashes cost and complexity, eliminating the middlebox and VNF sprawl that plague traditional WAN and legacy SD-WAN solutions. The solution extends the advantages of software-defined WANs all the way down to the branch office LAN, creating a new SD-Branch.

As IDC notes, "SD-WAN is a foundational component of SD-Branch. The most common function that will be deployed in an SD-Branch context is a virtualized router that enables SD-WAN. When enterprises use additional virtual network functions in conjunction with SD-WAN, then it becomes an SD-Branch."

The 128 Technology solution supports multiple network functions in a single VNF instance running on a low-cost COTS platform. Enterprises can execute network functions at the edge on the 128 Technology platform, and/or in the cloud, based on policy, to satisfy diverse business requirements or application needs. For example traffic from one enterprise organization could be steered through a 128 Technology stateful firewall at the edge, while traffic from a different enterprise organization could be routed through a NGFW running on Azure or AWS.

The 128 Technology solution provides the network component of what Gartner calls an identity-centric Secure Access Service Edge (SASE) architecture. The solution polices and manages traffic at the edge of the network, close to users and connected endpoints, for ultimate speed, efficiency and economics.

128 Technology Branch Office Use Case Examples

SaaS Solutions – on-demand business applications, office productivity suites, and communications and collaboration tools

Smart Buildings – automated lighting, HVAC, safety and security systems

Retail Stores – inventory tracking and management, PoS kiosks and digital signage, in-store analytics

Medical Offices and Clinics – telemedicine, electronic health records, picture archiving and communication systems

Bank Branches – interactive teller machines, self-service counters, digital signage

Industry 4.0 – predictive and preventive machine maintenance, process automation, quality control

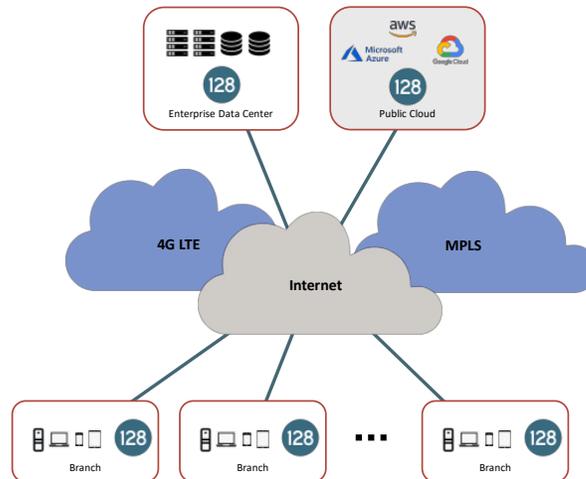
³SD-WAN to SD-Branch: The Evolution at the Edge of the Enterprise Network, IDC, 2020

Fundamental SASE functions include:

- **Session-Based Routing** - 128 Technology routers are session based and operate on sessions rather than individual packets, just like firewalls.
- **Service-Centric Routing** - 128T Session Smart networks are designed around modeling the applications that users consume. Service-centric networking is a top-down approach to configuring routing infrastructure. Rather than using interior gateway protocols (IGPs) to exchange routes and access-control lists (ACLs) to restrict access, administrators describe the services within the network and the group(s) within the network allowed to access each one.
- **Dynamic Global Discovery** - For SASE to be truly successful the network must be able to dynamically detect where services are located to be able to deliver valid sessions to those services. Service and Topology Exchange Protocol (STEP) enables 128 technology routers to exchange service and connection information to those services.
- **Identity-Based Access and Management Controls** - The 128 Technology solution institutes fine-grained, identity-based access and management controls at the edge, under the direction of a central policy server.

Agile, Secure and Resilient Branch Office Connectivity for Today's Digital Businesses

Ideal for today's distributed digital businesses, the 128 Technology solution provides agile, secure, resilient branch office connectivity for the cloud-first model of IT. The solution eliminates the inherent inefficiencies and cost constraints of legacy branch office networking solutions, delivering a flexible, application-aware network fabric that provides high performance, security and availability for cloud-centric, business-critical applications and services.



Performance

128T Session Smart Networking supports a variety of WAN optimization and intelligent routing features to ensure high performance and service quality for diverse applications and services. Fine-grained QoS controls let network administrators efficiently shape and prioritize traffic to enforce different SLAs for different dataflows. Innovative application-aware routing intelligently steers traffic based on administratively defined policies and real-time network conditions, automatically selecting the right network path (MPLS, 4G, internet) for the right application at the right time. Server load balancing capabilities automatically distribute branch workloads across cloud or data center resources to optimize application performance. And a unique lossless application delivery capability boosts WAN bandwidth utilization, helping improve performance over lower-capacity branch office connections.

Security

The 128 Technology solution protects applications and infrastructure against data loss and malicious attacks. Inherent security capabilities include deny-all (zero trust) routing, Layer 3/4 DoS/DDoS protection, and NAT and VPN functionality. 128 Technology's pioneering Secure Vector Routing approach provides strong data security without the overhead of traditional encryption protocols like IPsec. (Secure Vector Routing reduces protocol overhead by over 30% when compared to IPsec.) The tunnel-free architecture also gives network administrators full visibility into individual traffic flows, so they can efficiently monitor end-to-end sessions, evaluate service quality and troubleshoot problems.

128T Session Smart Networking radically simplifies the implementation and security of the branch office LAN by consolidating technology and by unifying and centralizing network and security operations. The solution integrates with popular NAC solutions like Genians and PacketFence to automatically discover endpoints and enforce fine-grained, identity-based access and management controls at the edge, under the direction of a central policy server. 128 Technology also offers seamless service function chaining integrations with cloud-based security services from Palo Alto Networks, Zscaler, Seceon and others for ultimate extensibility and choice.

Availability

128T Session Smart Networking provides continuous connectivity without requiring expensive hot-standby tunnels like conventional branch office networking solutions. In the event of a link failure or network outage, the 128 Technology solution seamlessly redirects traffic over an alternative path without disrupting sessions or impairing application performance. And enterprises can use the server load balancing capabilities to distribute workloads across data centers or availability zones to provide business continuity and disaster recovery for mission-critical services.

Ideal for deployment at unstaffed remote sites, the 128 Technology solution supports zero-touch provisioning and single-pane-of-glass, centralized management for simple installation, administration and maintenance. The table below summarizes some of the advantages 128T Session Smart Networking offers over alternative solutions for key branch office networking requirements.

Requirement	Traditional WAN and Legacy SD-WAN	128T Session Smart Networking
Low-cost branch office platform	Special-purpose middleboxes add cost and overhead. Legacy SD-WANs require expensive servers to support multiple dedicated VNFs.	128 Technology consolidates all network functions onto a single VNF that runs on inexpensive COTS or white box servers.
Easy turn-up and operations	Each middlebox has distinct CLI/EMS/APIs. Adds/moves/changes and troubleshooting are manually-intensive, error-prone and time-consuming.	Unified administration, auto-device discovery and zero-touch provisioning and upgrades, streamline deployment and management.
Strong security	Tunnel overlays safeguard data privacy, but limit visibility and control, and impair performance.	Secure Vector Routing protects data privacy, while enabling granular traffic management and visibility.
Application-specific service assurances	Tunnel overlays inhibit traffic management and prevent application-specific SLAs.	Fine-grained traffic management and application-aware routing enable application-specific, policy-based SLAs.
Continuous connectivity	Idle hot-standby tunnels are costly and inefficient.	Multi-path session migration provides cost-effective protection against link failures and ISP outages. Server load balancing provides BC/DR for critical applications.
Optimal performance over low-speed links	High-overhead tunneling protocols squander bandwidth and impair the performance of delay-sensitive applications.	Secure Vector Routing minimizes protocol overhead. Lossless application delivery optimizes bandwidth utilization and boosts application performance.

SUMMARY

Enterprises must re-architect branch office networks to support today's cloud-based applications and services. Traditional branch office networking appliances and legacy SD-WAN solutions, designed to support conventional enterprise IT architectures and traffic flows, are too costly and complicated for the digital era.

128T Session Smart Networking slashes branch office networking expense and complexity by consolidating functionality, eliminating technology sprawl and dramatically simplifying operations. The solution converges networking and network security functionality, enforcing policies close to the end-user, at the network perimeter, as part of an identity-centric Secure Access Service Edge architecture. Auto-discovery capabilities and zero-touch provisioning make it easy to turn-up services and roll out new applications without requiring truck rolls or on-site expertise.

The 128 Technology solution delivers a flexible, service-centric network fabric that meets the increased performance, agility and resiliency demands of the new cloud-first model of IT. It lays the foundation for an entirely new generation of branch office applications that help enterprises increase automation, improve productivity and boost business performance.

To learn how 128T Session Smart Networking can help your organization streamline branch office networking, accelerate digital transformation and improve business results, [contact](#) 128 Technology today.

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ABOUT 128 TECHNOLOGY

At 128 Technology we help our customers radically reinvent their digital futures based on a new model for virtual networking called Session Smart™. Session-smart networking enables enterprise customers and service providers to create a service-centric fabric that's more simple, agile, and secure, delivering better performance at a lower cost. Whether your enterprise is moving your business to the cloud, modernizing the WAN edge, seeking more reliable unified communications or pursuing an industrial internet of things (IIoT) initiative, session smart networking re-aligns networks with digital transformation initiatives.